June 19, 2012

Draft Charge for the June 2012 PAC Meeting

At its June 2012 meeting, the PAC will hear presentations on LBNE, Project X, a proposal for a polarized-beam Drell-Yan measurement, and three Letters of Intent related to neutrino experiments. Given the stage of all these items, the PAC is not asked for formal recommendations on any of them. However, the PAC is requested to comment on the physics goals in each case and the next steps appropriate to advance these goals.

For LBNE, Fermilab has been asked by the DOE to develop options within new cost guidelines. The options requested are for a phased program, with physics capability available at each stage. The PAC is requested to address whether the physics goals are well developed and clearly stated, and optimal in each case for the option being developed.

Similarly, Project X is now required to be staged. There is a workshop being held at Fermilab in parallel with the PAC meeting; so this is clearly also a work in progress. While leaders of the effort will make presentations to the PAC, these will be by remote video-conferencing. Nevertheless, we anticipate a lively exchange and again ask that the PAC comment on whether the physics goals are being well developed and clearly stated, and optimal in each case for the stages being developed.

The proposal received by the Laboratory is for an experiment to measure the Drell –Yan Process using a beam of polarized protons. Work is progressing on what it would take to provide such a beam of polarized protons, but the focus of the PAC deliberations should be on the physics goals of the proposed experiment. What would execution of the experiment contribute to physics? How does the proposed experiment fit into the international context in terms of its relationship to other polarized Drell-Yan and other measurements? Installation of polarized-beam components in the Main Injector appears to be incompatible with extraction of beam for the neutrino program. However, running time of the experiment could be scheduled with some overall impact on the neutrino

program if run over multiple years. More serious may be the fact that at this time, there is also no space in the Booster for required components and it is not known if new operating parameters can be found which would enable a solution.

The three Letters of Intent (GLADE, LAr1, and nuSTORM) outline approaches to strengthening the long-baseline neutrino program in the NuMI beamline and resolving anomalies observed in previous short-baseline neutrino experiments. While the details on each of the proposed efforts are not near the level appropriate for a proposal, it is possible to consider the physics goals and approaches. Two of the approaches use LAr detectors in essentially existing beams, while the third calls for a new facility to be designed and built. Please comment on the physics reach of each of these approaches, and what further physics definition or additional studies are appropriate. Is the technical approach in each case likely to achieve the identified physics goals? In the case of each Letter of Intent, how appropriate is it to encourage the proponents to pursue their intended experiment effort?

The schedule has time set aside for overall strategy discussions on each of the Intensity, Energy, and Cosmic Frontier areas. For each of the areas, please comment on the overall Fermilab strategy in light of the current program, planned next experiments, and future options, given the current funding expectations

Finally, there will be a number of additional presentations about Laboratory efforts. We would welcome any comments the PAC has on any of the topics presented.